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# **Foundry IronPoint 250**

## **Installation Guide**



**FOUNDRY**  
NETWORKS

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# Compliances

## FCC - Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

**FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **IMPORTANT NOTE:**

#### **FCC Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters (8 inches) between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

#### **FCC Channel Use Statement:**

The equipment version marketed in US is restricted to usage of the channels 1- 11 only.

#### **Wireless 2.4 Ghz and 5 GHz Band Statements:**

As the IronPoint can operate in the 5150-5250 MHz frequency band it is limited by the FCC, Industry Canada and some other countries to indoor use only so as to reduce the potential for harmful interference to co-channel Mobile Satellite systems.

High power radars are allocated as primary users (meaning they have priority) of the 5250-5350 MHz and 5650-5850 MHz bands. These radars could cause interference and/or damage to the IronPoint when used in Canada.

The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

## FCC Antenna Usage and Transmit Power

To comply with FCC/Canada telecommunication regulation, the conducted output power of this transmitter, when use with each specific antenna supplied, cannot exceed the maximum limit indicated in the following tables.

<b>802.11a RF Power Table for FCC</b>					
<b>External Antenna</b>	<b>Maximum Conducted Transmit Power (dBm)</b>				
	<b>5180 MHz</b>	<b>5240 MHz</b>	<b>5745 MHz</b>	<b>5785 MHz</b>	<b>5825 MHz</b>
4.5 dBi Integrated Antenna (FDS_2FED02)	11.64	14.91	24.6	24.9	25.2
8 dBi Omnidirectional Antenna (MMO24580608) (not including 2 dBi cable loss)	10.56	13.87	23.2	23.7	23.9

<b>802.11a Turbo Mode RF Power Table for FCC</b>			
<b>External Antenna</b>	<b>Maximum Conducted Transmit Power (dBm)</b>		
	<b>5210 MHz</b>	<b>5760 MHz</b>	<b>5800 MHz</b>
4.5 dBi Integrated Antenna (FDS_2FED02)	12.74	24.9	24.7
8 dBi Omnidirectional Antenna (MMO24580608) (not including 2 dBi cable loss)	11.42	23.5	23

<b>802.11b RF Power Table for FCC</b>			
<b>External Antenna</b>	<b>Maximum Conducted Transmit Power (dBm)</b>		
	<b>2412 MHz</b>	<b>2437 MHz</b>	<b>2462 MHz</b>
2 dBi Integrated Antenna (FDS_2FED02)	23.6	23.5	21.42
6 dBi Omnidirectional Antenna (MMO24580608) (not including 1 dBi cable loss)	19.25	20.6	20.5
4 dBi Bi-Directional Antenna (MHA2400PT)	17.25	18.75	18.5
13 dBi Directional Panel Antenna (MP24013XFPT)	17.25	18.75	15.95

<b>802.11g RF Power Table for FCC</b>			
<b>External Antenna</b>	<b>Maximum Conducted Transmit Power (dBm)</b>		
	<b>2412 MHz</b>	<b>2437 MHz</b>	<b>2462 MHz</b>
2 dBi Integrated Antenna (FDS_2FED02)	21.1	24.5	17.68
6 dBi Omnidirectional Antenna (MMO24580608) (not including 1 dBi cable loss)	19.4	24	17.2
4 dBi Bi-Directional Antenna (MHA2400PT)	19.4	24	16.7
13 dBi Directional Panel Antenna (MP24013XFPT)	15.6	21.75	11.6

## Industry Canada - Class B

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par l'Industrie.

### Industry Canada Statement

Operation is subject to the following two conditions:

- 1) This device may not cause interference and
- 2) This device must accept any interference, including interference that may cause undesired operation of the device

This device has been designed to operate with an antenna having a maximum gain of 13 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna Impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the EIRP is not more than required for successful communication.

Because high power radars are allocated as primary users (meaning they have priority) in 5250-5350 MHz, these radars could cause interference and/or damage to license exempt LAN devices.

## Japan VCCI Class B



この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると受信障害を引き起こすことがあります。  
取り扱い説明書に従って正しい取り扱いをして下さい。

## EC Declaration of Conformity CE0560!

Contact Foundry Networks at:

Foundry Networks, Inc.  
4980 Great America Parkway  
Santa Clara, CA 95054

Marking by the above symbol indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC). This equipment meets the following conformance standards:

- EN 60950 (IEC 60950) - Product Safety
- EN 301 893 - Technical requirements for 5 GHz radio equipment
- EN 300 328 - Technical requirements for 2.4 GHz radio equipment
- EN 301 489-1 / EN 301 489-17 - EMC requirements for radio equipment

### Countries of Operation & Conditions of Use in the European Community

This device is intended to be operated in all countries of the European Community. It is intended only for indoor use. License requirements and allowed channels of operation apply in some countries as described below:

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**Note:** The user must use the configuration utility provided with this product to ensure the channels of operation are in conformance with the spectrum usage rules for European Community countries as described below.

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- This device requires that the user or installer properly enter the current country of operation in the Command Line Interface (CLI) as described in the user guide, before operating this device.
- This device will automatically limit the allowable channels determined by the current country of operation. Incorrectly entering the country of operation may result in illegal operation and may cause harmful interference to other system. The user is obligated to ensure the device is operating according to the channel limitations, indoor/outdoor restrictions and license requirements for each European Community country as described in this document.
- This device employs a radar detection feature required for European Community operation in the 5 GHz band. This feature is automatically enabled when the country of operation is correctly configured for any European Community country. The presence of nearby radar operation may result in temporary interruption of operation of this device. The radar detection feature will automatically restart operation on a channel free of radar.
- The 5 GHz Turbo Mode feature is not allowed for operation in any European Community country. The current setting for this feature is found in the 5 GHz 802.11a Radio Settings Window as described in the user guide.
- The 5 GHz radio's AutoChannelSelect/SmartSelect setting described in the user guide must always remain enabled to ensure that automatic 5 GHz channel selection complies with European requirements. The current setting for this feature is found in the 5 GHz 802.11a Radio Settings Window as described in the user guide.
- This device is restricted to *indoor* use when operated in the European Community using the 5.15 - 5.25 GHz band: Channels 36, 40, 44, 48. See table below for allowed 5 GHz channels by country.
- This device is restricted for *indoor* use when operated in all countries of the European Community using the 2.4 GHz band: Channels 1 - 13.

## Operation Using 5 GHz Channels in the European Community

The user/installer must use the provided configuration utility to check the current channel of operation and make necessary configuration changes to ensure operation occurs in conformance with European National spectrum usage laws as described below and elsewhere in this document.

Allowed 5GHz Channels in Each European Community Country		
Allowed Frequency Bands	Allowed Channel Numbers	Countries
5.15 - 5.25* GHz	36, 40, 44, 48	Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, U.K.
5 GHz Operation Not Allowed	None	Greece, Hungary

\* Outdoor operation is not allowed using 5.15-5.25 GHz bands (Channels 36 to 48).

By selecting the appropriate country codes detailed on page 4-7 of this guide you will ensure the device operates within the frequency restrictions detailed above. You are responsible for ensuring the device is used indoors-only and for private use only as applicable.

## Transmit Power Control (TPC) for 5GHz Operation

The end-user must operate this device in accordance with European regulatory requirements for Transmit Power Control. This device employs Transmit Power Control (TPC) to reduce the potential for interference to other communication systems operating in the 5 GHz frequency bands. The TPC feature implemented in this wireless LAN device must be configured by the end-user when operating in any European Community country.

The required configuration procedure for TPC is found in the user guide for this product.

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**Note:** The TPC procedure should be repeated when relocating this wireless device within the current wireless network or to a wireless network in a new location.

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## Declaration of Conformity in Languages of the European Community

English	Hereby, Foundry Networks, declares that this Radio LAN device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Finnish	Valmistaja Foundry Networks vakuuttaa täten että Radio LAN device tyypin laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Dutch	Hierbij verklaart Foundry Networks dat het toestel Radio LAN device in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG Bij deze Foundry Networks dat deze Radio LAN device voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.
French	Par la présente Foundry Networks déclare que l'appareil Radio LAN device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE
Swedish	Härmed intygar Foundry Networks att denna Radio LAN device står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Danish	Undertegnede Foundry Networks erklærer herved, at følgende udstyr Radio LAN device overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF

German	Hiermit erklärt Foundry Networks, dass sich dieser/diese/dieses Radio LAN device in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi)  Hiermit erklärt Foundry Networks die Übereinstimmung des Gerätes Radio LAN device mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Greek	Με την παρούσα Foundry Networks δηλώνει οτι radio LAN device συμμορφωνεται προσ τις ουσιωδεις απαιτησεις και τις λοιπες σχετικες διαταξεις της οδηγιας 1999/5/εκ
Italian	Con la presente Foundry Networks dichiara che questo Radio LAN device è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Spanish	Por medio de la presente Foundry Networks declara que el Radio LAN device cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE
Portuguese	Foundry Networks declara que este Radio LAN device está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

## Australia/New Zealand AS/NZS 4771



ARBN 094 044 809

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4980 Great America Parkway  
Santa Clara, CA 95054

## Safety Compliance

### Power Cord Safety

**Please read the following safety information carefully before installing the access point:**

**WARNING:** Installation and removal of the unit must be carried out by qualified personnel only.

- The unit must be connected to an earthed (grounded) outlet to comply with international safety standards.
- Do not connect the unit to an A.C. outlet (power supply) without an earth (ground) connection.
- The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN 60320/IEC 320 appliance inlet.
- The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.
- This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.

*France and Peru only*

This unit cannot be powered from IT<sup>†</sup> supplies. If your supplies are of IT type, this unit must be powered by 230 V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labelled Neutral, connected directly to earth (ground).

<sup>†</sup> *Impédance à la terre*

Power Cord Set	
U.S.A. and Canada	The cord set must be UL-approved and CSA certified.
	The minimum specifications for the flexible cord are: - No. 18 AWG - not longer than 2 meters, or 16 AWG. - Type SV or SJ - 3-conductor
	The cord set must have a rated current capacity of at least 10 A
	The attachment plug must be an earth-grounding type with NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
Denmark	The supply plug must comply with Section 107-2-01, Standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
U.K.	The supply plug must comply with BS1363 (3-pin 13 A) and be fitted with a 5 A fuse which complies with BS1362.
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
Europe	The supply plug must comply with CEE7/7 ("SCHUKO").
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
	IEC-320 receptacle.

**Veuillez lire à fond l'information de la sécurité suivante avant d'installer le access point:**

**AVERTISSEMENT:** L'installation et la dépose de ce groupe doivent être confiés à un personnel qualifié.

- Ne branchez pas votre appareil sur une prise secteur (alimentation électrique) lorsqu'il n'y a pas de connexion de mise à la terre (mise à la masse).
- Vous devez raccorder ce groupe à une sortie mise à la terre (mise à la masse) afin de respecter les normes internationales de sécurité.
- Le coupleur d'appareil (le connecteur du groupe et non pas la prise murale) doit respecter une configuration qui permet un branchement sur une entrée d'appareil EN 60320/IEC 320.
- La prise secteur doit se trouver à proximité de l'appareil et son accès doit être facile. Vous ne pouvez mettre l'appareil hors circuit qu'en débranchant son cordon électrique au niveau de cette prise.
- L'appareil fonctionne à une tension extrêmement basse de sécurité qui est conforme à la norme IEC 60950. Ces conditions ne sont maintenues que si l'équipement auquel il est raccordé fonctionne dans les mêmes conditions.

*France et Pérou uniquement:*

Ce groupe ne peut pas être alimenté par un dispositif à impédance à la terre. Si vos alimentations sont du type impédance à la terre, ce groupe doit être alimenté par une tension de 230 V (2 P+T) par le biais d'un transformateur d'isolement à rapport 1:1, avec un point secondaire de connexion portant l'appellation Neutre et avec raccordement direct à la terre (masse).

<b>Cordon électrique - Il doit être agréé dans le pays d'utilisation</b>	
Etats-Unis et Canada:	<p>Le cordon doit avoir reçu l'homologation des UL et un certificat de la CSA.</p> <p>Les spécifications minimales pour un câble flexible sont AWG No. 18, ou AWG No. 16 pour un câble de longueur inférieure à 2 mètres.</p> <ul style="list-style-type: none"> <li>- type SV ou SJ</li> <li>- 3 conducteurs</li> </ul> <p>Le cordon doit être en mesure d'acheminer un courant nominal d'au moins 10 A.</p> <p>La prise femelle de branchement doit être du type à mise à la terre (mise à la masse) et respecter la configuration NEMA 5-15P (15 A, 125 V) ou NEMA 6-15P (15 A, 250 V).</p>
Danemark:	La prise mâle d'alimentation doit respecter la section 107-2-01 de la norme DK2 1a ou DK2 5a.
Suisse:	La prise mâle d'alimentation doit respecter la norme SEV/ASE 1011.
Europe	<p>La prise secteur doit être conforme aux normes CEE 7/7 ("SCHUKO")</p> <p>Le cordon secteur doit porter la mention &lt;HAR&gt; ou &lt;BASEC&gt; et doit être de type HO3VVF3GO.75 (minimum).</p>

**Bitte unbedingt vor dem Einbauen des access point die folgenden Sicherheitsanweisungen durchlesen:**

**WARNUNG:** Die Installation und der Ausbau des Geräts darf nur durch Fachpersonal erfolgen.

- Das Gerät sollte nicht an eine ungeerdete Wechselstromsteckdose angeschlossen werden.
- Das Gerät muß an eine geerdete Steckdose angeschlossen werden, welche die internationalen Sicherheitsnormen erfüllt.
- Der Gerätestecker (der Anschluß an das Gerät, nicht der Wandsteckdosenstecker) muß einen gemäß EN 60320/IEC 320 konfigurierten Geräteeingang haben.
- Die Netzsteckdose muß in der Nähe des Geräts und leicht zugänglich sein. Die Stromversorgung des Geräts kann nur durch Herausziehen des Gerätenetzkabels aus der Netzsteckdose unterbrochen werden.
- Der Betrieb dieses Geräts erfolgt unter den SELV-Bedingungen (Sicherheitskleinstspannung) gemäß IEC 60950. Diese Bedingungen sind nur gegeben, wenn auch die an das Gerät angeschlossenen Geräte unter SELV-Bedingungen betrieben werden.

<b>Stromkabel.</b> Dies muss von dem Land, in dem es benutzt wird geprüft werden:	
Schweiz	Dieser Stromstecker muß die SEV/ASE 1011 Bestimmungen einhalten.
Europe	<p>Das Netzkabel muß vom Typ HO3VVF3GO.75 (Mindestanforderung) sein und die Aufschrift &lt;HAR&gt; oder &lt;BASEC&gt; tragen.</p> <p>Der Netzstecker muß die Norm CEE 7/7 erfüllen ("SCHUKO").</p>

# Contents

<b>Compliances . . . . .</b>	<b>iii</b>
<b>Chapter 1.</b>	
<b>About This Guide . . . . .</b>	<b>1-1</b>
Audience . . . . .	1-1
Nomenclature . . . . .	1-1
How to Get Help . . . . .	1-1
Foundry Networks Technical Support . . . . .	1-1
Web Access . . . . .	1-2
E-mail Access . . . . .	1-2
Telephone Access . . . . .	1-2
Warranty Coverage . . . . .	1-2
Related Publications . . . . .	1-2
What's New in this Edition . . . . .	1-2
<b>Chapter 2.</b>	
<b>About the IronPoint 250 . . . . .</b>	<b>2-1</b>
Overview . . . . .	2-1
Radio Characteristics . . . . .	2-2
Management Options . . . . .	2-2
Description of Hardware . . . . .	2-3
Ethernet Port . . . . .	2-3
Antennas . . . . .	2-3
Optional External Antenna . . . . .	2-3
Status LEDs . . . . .	2-5
Security Slot . . . . .	2-6
Console Port . . . . .	2-6
Reset Button . . . . .	2-6
Power Connector . . . . .	2-6

Features and Benefits .....	2-7
Connectivity .....	2-7
Management .....	2-7
<b>Chapter 3.</b> <b>Network Planning .....</b>	<b>3-1</b>
Network Topologies .....	3-1
Infrastructure Wireless LAN .....	3-2
Infrastructure Wireless LAN for Roaming Wireless PCs .....	3-2
<b>Chapter 4.</b> <b>Installing the IronPoint 250 Access Point .....</b>	<b>4-1</b>
Unpacking the IronPoint Access Point .....	4-1
Installing the IronPoint Access Point .....	4-1
Placing the Access Point on a Desktop or Shelf .....	4-2
Attaching the Access Point to a Wall Using the Mounting Bracket .....	4-2
Attaching the Access Point to a Suspended Ceiling .....	4-4
Locking the Access Point .....	4-5
Installing an External Antenna .....	4-5
Powering Up the Access Point .....	4-6
Adding the IronPoint Access Point to the Network .....	4-7
<b>Chapter 5.</b> <b>Making a Network Connection .....</b>	<b>5-1</b>
Connecting to a Network Device .....	5-1
Twisted-Pair Cable .....	5-1
Cabling Guidelines .....	5-1
Connecting to a Switch, Hub, PC, or Server .....	5-2
<b>Appendix A.</b> <b>Troubleshooting .....</b>	<b>A-1</b>
Diagnosing Access Point Indicators .....	A-1
Installation .....	A-1
Console Access .....	A-1
In-Band Access .....	A-2
Wireless Client Network Access .....	A-2
Lost Password .....	A-3
Reset the Access Point Default Settings .....	A-3
<b>Appendix B.</b> <b>Cables .....</b>	<b>B-1</b>
Specifications .....	B-1
Twisted-Pair Cable and Pin Assignments .....	B-1
100BASE-TX/10BASE-T Pin Assignments .....	B-2
Straight-Through Wiring .....	B-2

Crossover Wiring . . . . .	B-2
Console Port Pin Assignments . . . . .	B-3
Wiring Map for Serial Cable . . . . .	B-3
<b>Appendix C.</b> <b>Specifications . . . . .</b>	<b>C-1</b>
General Specifications . . . . .	C-1
Sensitivity . . . . .	C-4
Maximum Distance Tables . . . . .	C-5
<b>Appendix 1.</b> <b>Cautions and Warnings . . . . .</b>	<b>1-1</b>
Cautions . . . . .	1-1
Warnings . . . . .	1-3
<b>Glossary</b>	
<b>Index</b>	



# Chapter 1

## About This Guide

The IronPoint™ 250 Access Point is a device that allows wireless clients to connect to your enterprise network. It is a full-featured access point that can be managed as a single device.

This guide presents the procedures for installing the IronPoint™ 250 Access Point.

### Audience

This guide is for system administrators with a working knowledge of wireless networks and network management.

You should be familiar with switching and networking concepts.

### Nomenclature

This guide uses the following typographical conventions to show information:

**Warning:** A warning calls your attention to a possible hazard that can cause injury or death.

**Caution:** A caution calls your attention to a possible hazard that can damage equipment.

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**Note:** A note emphasizes an important fact or calls your attention to a dependency.

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### How to Get Help

If you need assistance, Foundry Networks is committed to ensuring that your investment in our products remains cost-effective by offering a variety of support options.

#### Foundry Networks Technical Support

Foundry Networks technical support will ensure that the fast and easy access that you have come to expect from your Foundry Networks products will be maintained.

## Web Access

Point your browser to the [kp.foundrynet.com](http://kp.foundrynet.com) to access the Foundry Knowledge Portal.

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**Note:** Check with your sales account representative to determine how to obtain a valid user name and password for the Foundry Knowledge Portal.

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## E-mail Access

Technical requests can also be sent to the e-mail address: [support@foundrynet.com](mailto:support@foundrynet.com)

## Telephone Access

- ◆ 1.877.TURBOCALL (887.2622): United States
- ◆ 1.408.586.1881: Outside the United States

## Warranty Coverage

Contact Foundry Networks using any of the methods listed above for information about the standard and extended warranties.

## Related Publications

Refer to the *Foundry IronPoint Access Point User Guide* for instructions on how to configure and manage the access point.

## What's New in this Edition

This is the first release of this guide.

# Chapter 2

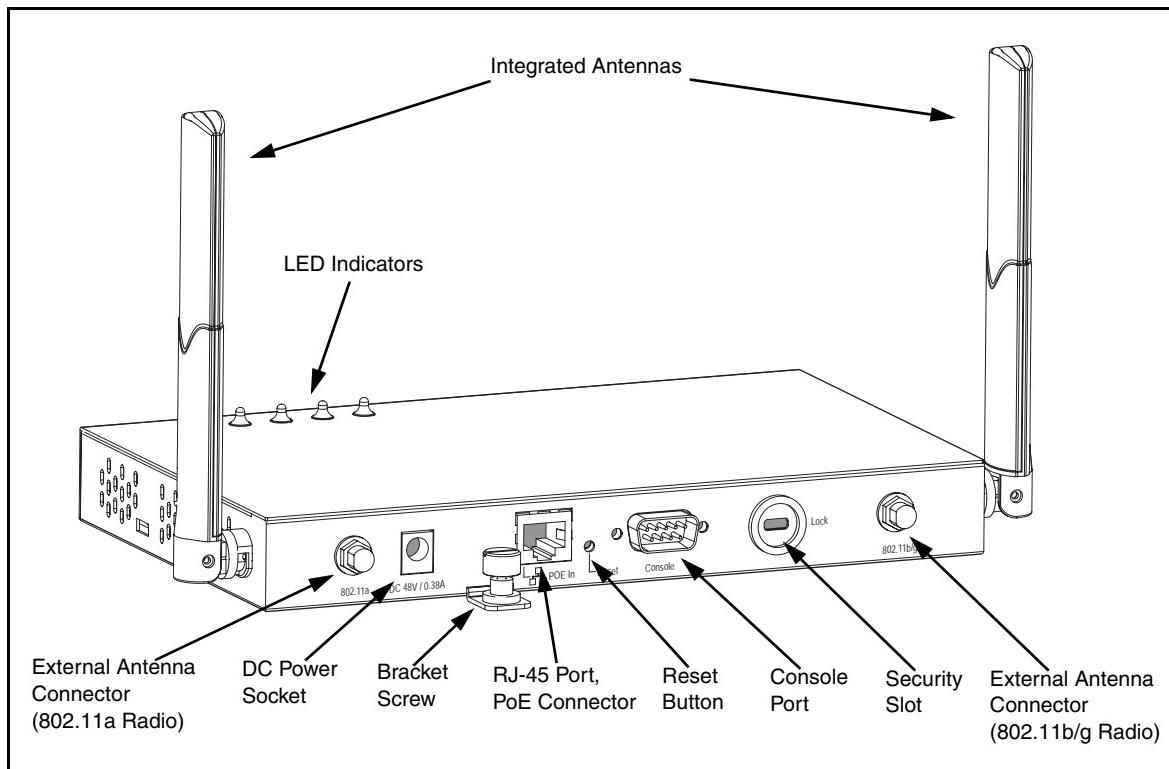
## About the IronPoint 250

### Overview

Foundry's IronPoint 250 is an IEEE 802.11a/g enterprise wireless access point that provides high-speed data communications between the wired LAN and fixed, portable or mobile devices equipped with an 802.11a, 802.11b, or 802.11g wireless network card.

The access point offers full network management capabilities through a command line interface for initial configuration and troubleshooting, a Web interface, and Simple Network Management tools.

**Figure 2-1. Top and Front Panels**



## Radio Characteristics

The IEEE 802.11a/g standard uses a radio modulation technique known as Orthogonal Frequency Division Multiplexing (OFDM), and a shared collision domain (CSMA/CA). It operates at the 5 GHz Unlicensed National Information Infrastructure (UNII) band for connections to 802.11a clients, and at 2.4 GHz for connections to 802.11g clients.

IEEE 802.11g includes backward compatibility with the IEEE 802.11b standard. IEEE 802.11b also operates at 2.4 GHz, but uses Direct Sequence Spread Spectrum (DSSS) modulation technology to achieve a communication rate of up to 11 Mbps.

The access point also supports a 54 Mbps half-duplex connection to Ethernet networks for each active channel (up to 108 Mbps in turbo mode on the 802.11a interface).

## Management Options

The IronPoint 250 contains LEDs for “at-a-glance” monitoring of wireless and network port status. It also includes a built-in network management agent that allows the access point to be managed in-band using SNMP, with a Web browser, or remotely via Telnet and SSH. The access point provides an RS-232 DCE serial port (DB-9 connector) on the front panel for out-of-band management. A PC may be connected to this port for configuration and monitoring out-of band via a null-modem serial cable. (See “Console Port Pin Assignments” on page B-3 for wiring options.)

For a detailed description of the access point’s management features, refer to the *Foundry IronPoint Access Point User Guide*.

## Description of Hardware

### Ethernet Port

The access point has one 10BASE-T/100BASE-TX RJ-45 Ethernet port that can be attached directly to a 10BASE-T/100BASE-TX/1000BASE-T wired network. The wired network must conform to the IEEE 802.3-2005 specifications.

The Ethernet port supports automatic MDI/MDI-X operation, so you can use straight-through cables for all network connections to PCs, switches, or hubs.

The access point appears as an Ethernet node and performs a bridging function by moving packets from the wired network to remote workstations in the wireless infrastructure.

---

**Note:** The RJ-45 port supports Power over Ethernet (PoE) based on the IEEE 802.3af standard. Refer to the description for the “Power Connector” for information on supplying power to the access point’s network port from a network device, such as a switch, that provides Power over Ethernet (PoE).

---

### Antennas

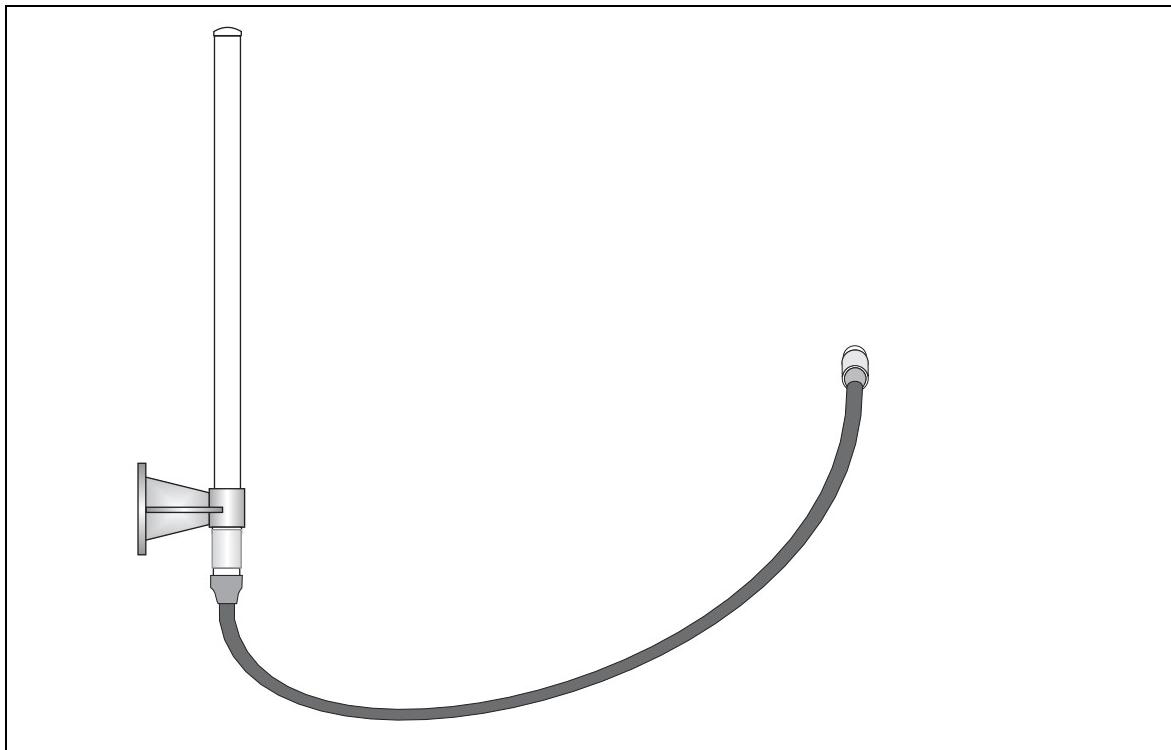
The access point includes two integrated diversity antennas for wireless communications. A diversity antenna system uses two identical antennas to receive and transmit signals, helping to avoid multipath fading effects. When receiving, the access point checks both antennas and selects the one with the strongest signal. When transmitting, it will continue to use the antenna previously selected for receiving. The access point never transmits from both antennas at the same time.

The antennas transmit the outgoing signal as a toroidal sphere (doughnut shaped), with the coverage extending most in a direction perpendicular to the antenna. The antenna should be adjusted to an angle that provides appropriate coverage for the service area. For further information, see “Installing the IronPoint Access Point” on page 4-1.

### Optional External Antenna

The access point supports RP-SMA external antenna connectors for both the 2.4 GHz and 5 GHz radios. External antennas offer a variety of options for extending the radio range and shaping the coverage area. When an external antenna is connected, you must manually configure the software to disable the two integrated antennas and uses only the external antenna.

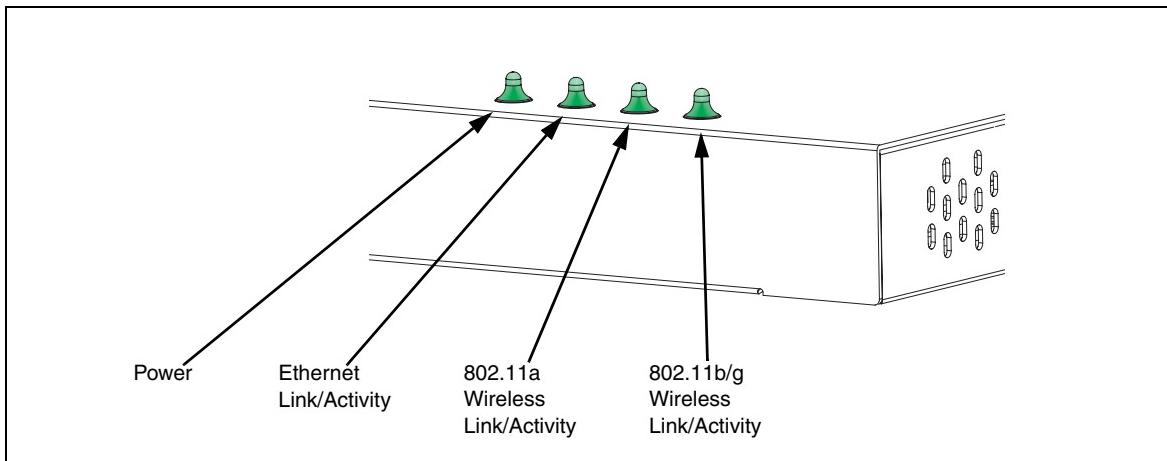
**Figure 2-2. An Example of an Optional External Antenna**



## Status LEDs

The access point includes four status LED indicators, as described in the following figure and table.

**Figure 2-3. Status LEDs**



Status LEDs		
LED	Status	Description
Status	On Green	Indicates that power is being supplied and the system is working normally.
	Flashing Green	Indicates - <ul style="list-style-type: none"><li>• the access point is running its self-test</li><li>• the access point is loading a software file</li></ul>
	On Amber	Indicates a CPU or system failure.
	Flashing Amber (Prolonged)	Indicates a system error.
Link	On Green	Indicates a valid 10/100 Mbps Ethernet cable link.
	Flashing Green	Indicates that the access point is transmitting or receiving data on the attached 10/100 Mbps Ethernet LAN. The flashing rate is proportional to network activity.
	Off	Indicates no 10/100 Mbps Ethernet cable link.
Radio a	On Green	Indicates the 802.11a radio is enabled.
	Flashing Green	Indicates that the access point is transmitting or receiving data through 802.11a wireless links. The flashing rate is proportional to network activity.
	Off	Indicates the 802.11a radio is disabled.
Radio b/g	On Green	Indicates the 802.11g radio is enabled.
	Flashing Green	Indicates that the access point is transmitting or receiving data through 802.11g or 802.11b wireless links. The flashing rate is proportional to network activity.
	Off	Indicates the 802.11g radio is disabled.

## **Security Slot**

The access point includes a Kensington security slot on the rear panel. You can prevent unauthorized removal of the access point in several ways: by wrapping Foundry's locking clamp (lock not provided) or by using a Kensington security cable (not provided).

## **Console Port**

This port is used to connect a console device to the access point through a serial cable. This connection is described under "Console Port Pin Assignments" on page B-3. The console device can be a PC or workstation running a VT-100 terminal emulator, or a VT-100 terminal.

## **Reset Button**

This button is used to reset the access point or restore the factory default configuration. If you hold down the button for less than 5 seconds, the access point will perform a hardware reset. If you hold down the button for 5 seconds or more, any configuration changes you may have made are removed, and the factory default configuration is restored to the access point.

## **Power Connector**

The access point does not have a power switch. It is powered on when connected to the AC power adapter, and the power adapter is connected to a power source. The access point automatically adjusts to any voltage between 100-240 volts at 50 or 60 Hz. No voltage range settings are required.

The access point may also receive Power over Ethernet (PoE) from a switch or other network device that supplies power over the network cable based on the IEEE 802.3af standard.

Note that if the access point is connected to a PoE source device and also connected to a local power source through the AC power adapter, power will be taken from the PoE source.

## Features and Benefits

### Connectivity

- ◆ 54 Mbps wireless interface supports up to 64 mobile users
- ◆ Local network connection via 10/100 Mbps Ethernet port
- ◆ IEEE 802.11a, 802.11b, and 802.11g compliant on the wireless interfaces
- ◆ IEEE 802.3-2005 compliant on the Ethernet interface
- ◆ Ethernet port supports Power over Ethernet based on the IEEE 802.3af standard
- ◆ Provides seamless roaming within the IEEE 802.11a, 802.11b, and 802.11g WLAN environment
- ◆ Scans all available channels and selects the best channel for each client based on the signal-to-noise ratio
- ◆ Optional high-gain 2.4 GHz and 5 GHz external antennas can be attached to extend the service area
- ◆ Advanced security through 64/128/152-bit Wired Equivalent Protection (WEP) encryption, IEEE 802.1x port authentication, Wi-Fi Protected Access (WPA), SSID broadcast disable, remote authentication via RADIUS server, and MAC address filtering
- ◆ Auto-negotiation enables the Ethernet port to automatically select the optimum communication mode (half or full duplex) if this feature is supported by the attached device; otherwise the port can be configured manually

### Management

- ◆ “At-a-glance” LEDs for easy troubleshooting
- ◆ Network management agent:
  - Supports Telnet, SSH v2, SNMP v2 and v3, and Web-based HTTP and HTTPS interface
  - Supports out-of-band RS-232 console port (VT100)



# Chapter 3

## Network Planning

### Network Topologies

The IronPoint 250 supports an integrated configuration with 10/100 Mbps Ethernet LANs.

One or more access points can be configured as:

- Infrastructure for wireless LANs
- Infrastructure wireless LAN for roaming wireless PCs

The 802.11b and 802.11g frequency band which operates at 2.4 GHz can easily encounter interference from other 2.4 GHz devices, such as other 802.11b or g wireless devices, cordless phones and microwave ovens. If you experience poor wireless LAN performance, try the following measures:

- Limit any possible sources of radio interference within the service area
- Increase the distance between neighboring access points
- Decrease the signal strength of neighboring access points
- Increase the channel separation of neighboring access points (e.g., at least 3 channels for 802.11a, or at least 5 channels for 802.11b/g)

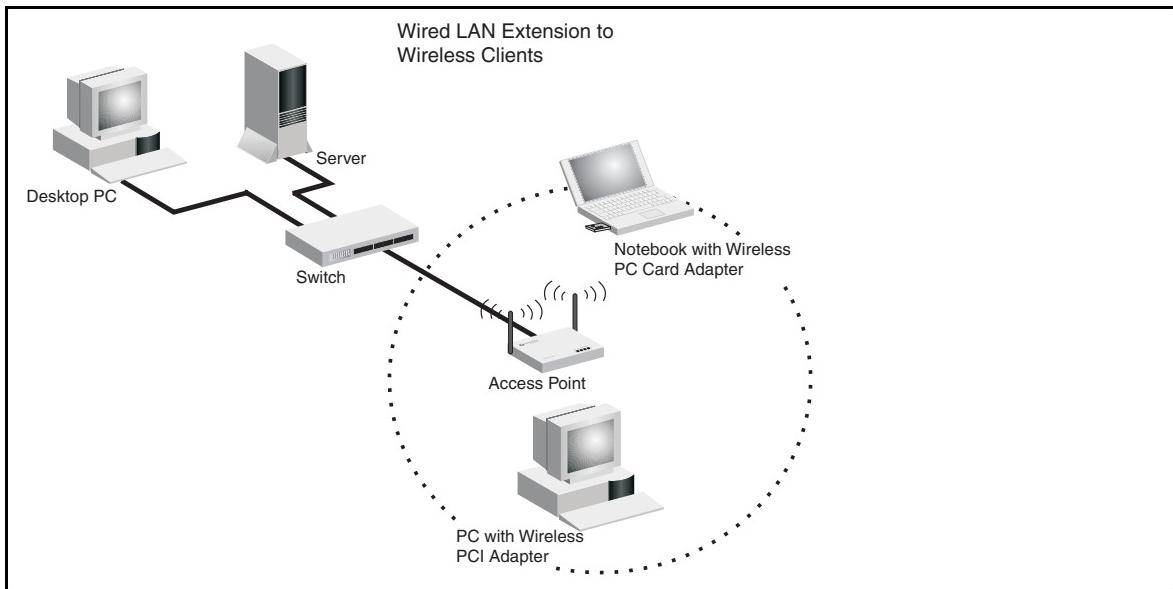
## Infrastructure Wireless LAN

The IronPoint 250 is designed to provide access to a wired LAN for wireless workstations. An integrated wired/wireless LAN is called an Infrastructure configuration. A Basic Service Set (BSS) consists of a group of wireless PC users and an access point that is directly connected to the wired LAN. Each wireless station in this BSS can communicate with any device in its wireless group via a radio link, or access other computers or network resources in the wired LAN infrastructure via the access point.

The infrastructure configuration not only extends the accessibility of wireless PCs to the wired LAN, but also increases the effective wireless transmission range for wireless PCs by passing their signal through one or more access points.

A wireless infrastructure can be used for access to a central database, or for a connection between mobile workers, as shown in the following figure.

**Figure 3-1. Infrastructure Wireless LAN**



## Infrastructure Wireless LAN for Roaming Wireless PCs

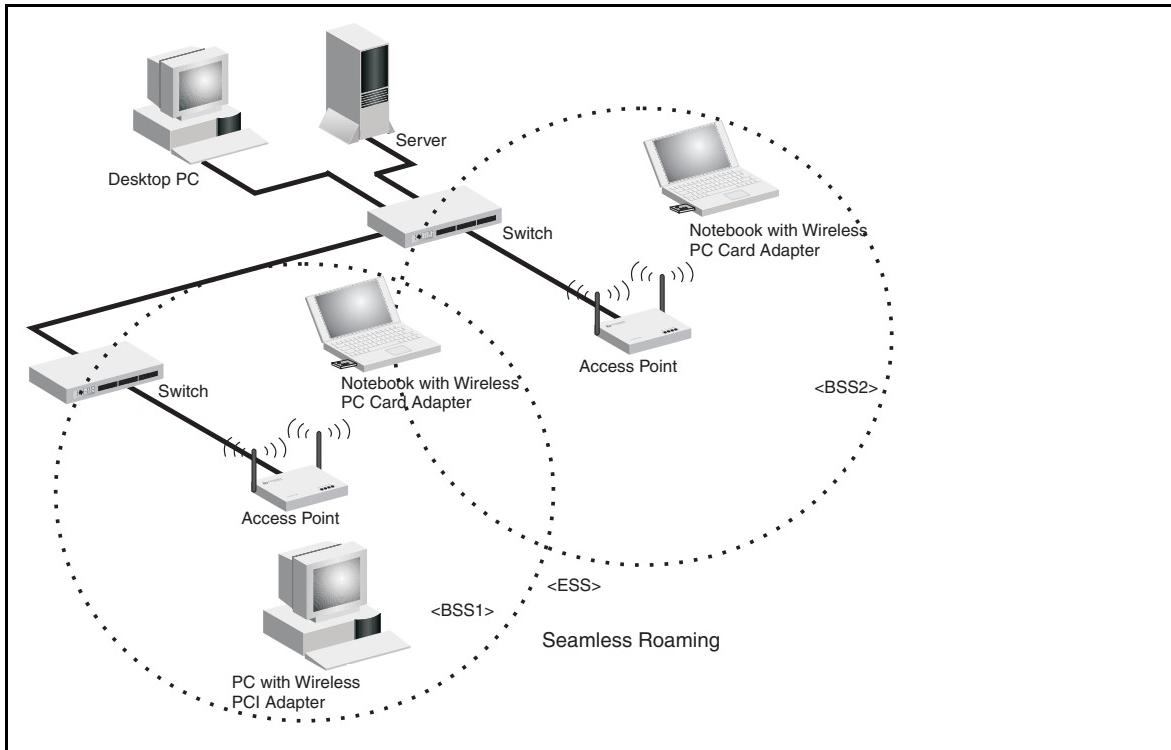
The Basic Service Set (BSS) defines the communications domain for each access point and its associated wireless clients. The BSS ID is a 48-bit binary number based on the access point's wireless MAC address, and is set automatically and transparently as clients associate with the access point. The BSS ID is used in frames sent between the access point and its clients to identify traffic in the service area.

The BSS ID is only set by the access point, never by its clients. The clients only need to set the Service Set Identifier (SSID) that identifies the service set provided by one or more access points. The SSID can be manually configured by the clients, can be detected in an access point's beacon, or can be obtained by querying for the identity of the nearest access point. For clients that do not need to roam, set the SSID for the wireless card to that used by the access point to which you want to connect.

A wireless infrastructure can also support roaming for mobile workers. More than one access point can be configured to create an Extended Service Set (ESS). By placing the access points so that a

continuous coverage area is created, wireless users within this ESS can roam freely. All wireless network cards and access points within a specific ESS must be configured with the same SSID.

**Figure 3-2. Wireless LAN Roaming**





# Chapter 4

## Installing the IronPoint 250 Access Point

This section presents procedures for installing the IronPoint 250 access point.

### Unpacking the IronPoint Access Point

Unpack the IronPoint 250 access point and make sure the following components are included in the box:

- One IronPoint 250 access point
- One External Power supply and power cable
- RS-232 console cable
- IronPoint 250 access point mounting bracket with lock clamp
- Ceiling tile mounting clamp
- CD-ROM containing the IronPoint Access Point manuals, drivers, and utility
- 4 adhesive feet

### Installing the IronPoint Access Point

Select a location to install the IronPoint 250 access point. The best location is at the center of your wireless coverage area, within the line of sight of all wireless devices. The access point can be placed on a horizontal surface or mounted on the wall, with or without the mounting bracket. It can also be mounted on a suspended ceiling.

---

**WARNING:** This product is suitable for use in environmental air space in accordance with the Section 300-22(c) of the National Electric Code (NEC) and Sections 2- 128.12 - 010 (3) and 12 - 100 of the Canadian Electrical Code. Part 1. C22. 1. For other countries, consult local authorities for regulations.

---

**WARNING:** Any Fast Ethernet (FE) cables installed in air-handling spaces should be suitable under NEC Article 800.50 and marked accordingly for use in plenums and air-handling spaces with regard to smoke propagation, such as CL2-P, CL3-P, MPP (Multi Purpose Plenum), or CMP (Communications Plenum).

---

**CAUTION:** When mounting the access point on a wall or suspended ceiling, use PoE power ONLY. Do not use the AC power adapter.

---

**Note:** For safety reasons, make sure ventilation holes on the access point are positioned horizontally, not vertically. Allow at least 1 inch (2.54 centimeters) clearance around the ventilation holes for proper ventilation.

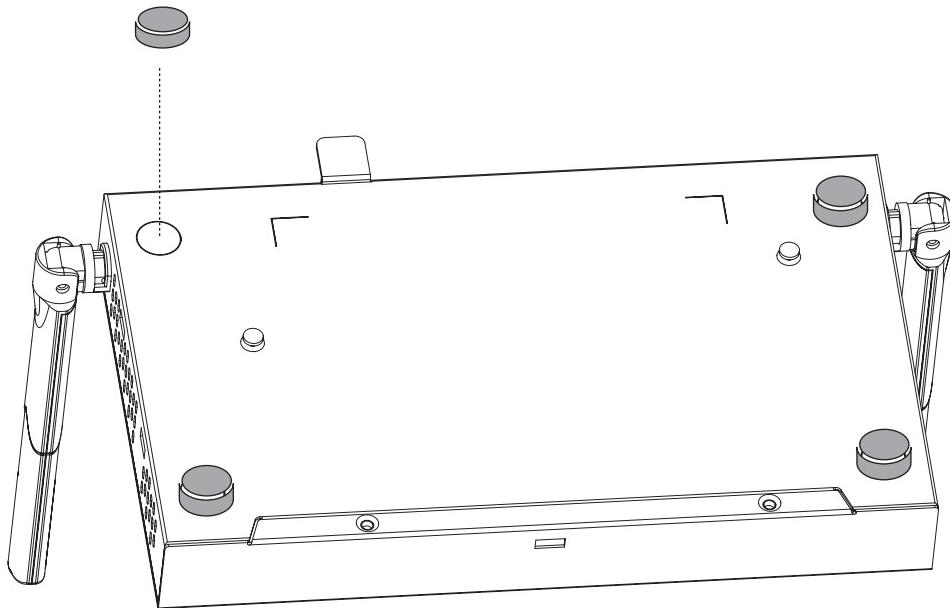
---

## Placing the Access Point on a Desktop or Shelf

Do the following if you want to mount the access point on a horizontal surface, such as a desktop or shelf:

1. Attach the four adhesive feet to the bottom panel of the access point (Figure 4-1).

**Figure 4-1. Attaching Feet to the Access Point**



2. Set the access point on its four rubber feet on the desktop, shelf, or flat surface, making sure there is enough clearance around the ventilation holes for proper air flow. For safety reasons, make sure ventilation holes on the access point are positioned horizontally, not vertically.
3. Position the antennas along the same axes. Each antenna emits a radiation pattern that is toroidal (doughnut shaped), with the coverage extending most in the direction perpendicular to the antenna. Therefore, the antennas should be oriented so that the radio coverage pattern fills the intended service area. Also, the diversity antennas should both be positioned along the same axes, providing the same coverage. For example, if the access point is mounted on a horizontal surface, both antennas should be positioned pointing vertically up to provide optimum coverage.

## Attaching the Access Point to a Wall Using the Mounting Bracket

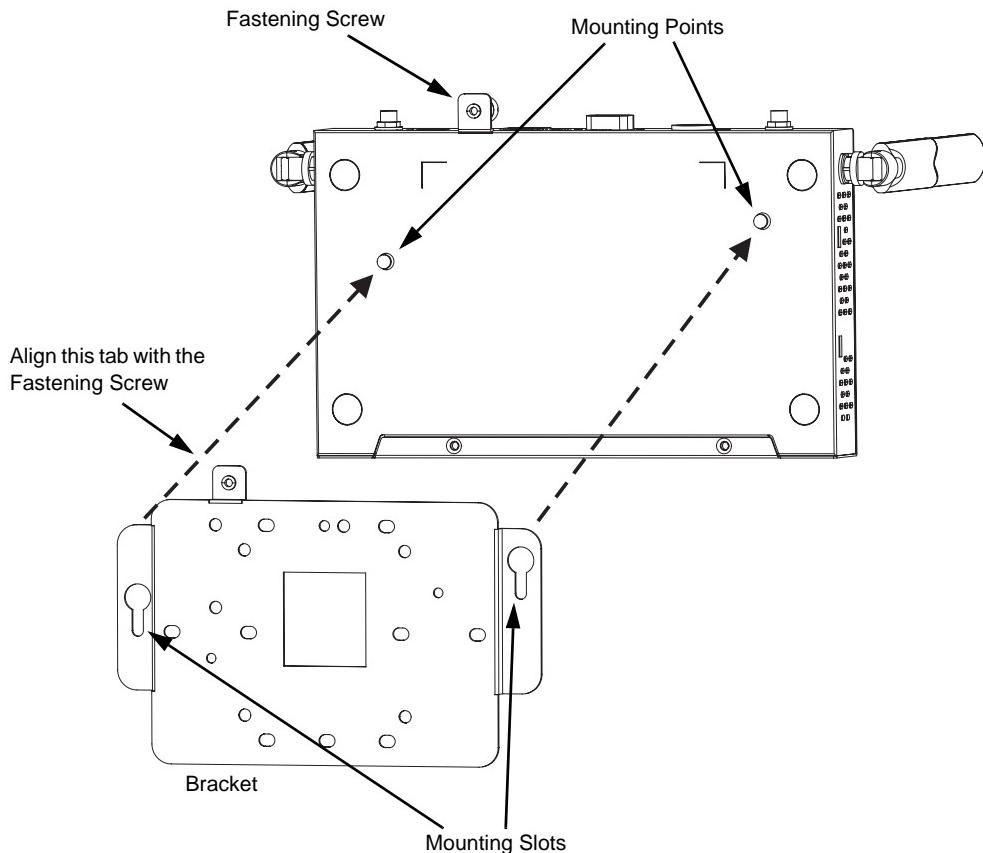
The access point should be mounted only to a wall or wood surface that is at least 1/2-inch plywood or its equivalent. To mount the access point on a wall, always use its wall-mounting bracket. The

access point must be mounted with the RJ-45 cable connector oriented upwards to ensure proper operation.

Do the following to attach the access point to the wall using the mounting bracket:

1. Using the mounting bracket, mark the position of the four screw holes on the wall. For concrete or brick walls, you will need to drill holes and insert wall plugs for the screws.
2. Position the mounting bracket over the wall screw holes, then insert the included screws and tighten them down to secure the bracket firmly to the wall. Use 5/8-inch number 12 wood screws or a near equivalent (not included in the package contents).
3. Attach the access point to the mounting bracket. Line up the two mounting points on the bracket with the two mounting slots on the bottom of the access point (see the following figure). Place the mounting points of the bracket into the mounting slots of the bracket, slide it into position so that the bracket fastening screw on the access point lines up with the tab on the bracket. Then screw down the fastening screw to secure the access point to the bracket.

**Figure 4-2. Installing the Access Point on the Mounting Bracket**



4. Position the antennas along the same axes. Each antenna emits a radiation pattern that is toroidal (doughnut shaped), with the coverage extending most in the direction perpendicular to the antenna. Therefore, the antennas should be oriented so that the radio coverage pattern fills the intended service area. Also, the diversity antennas should both be positioned along the same

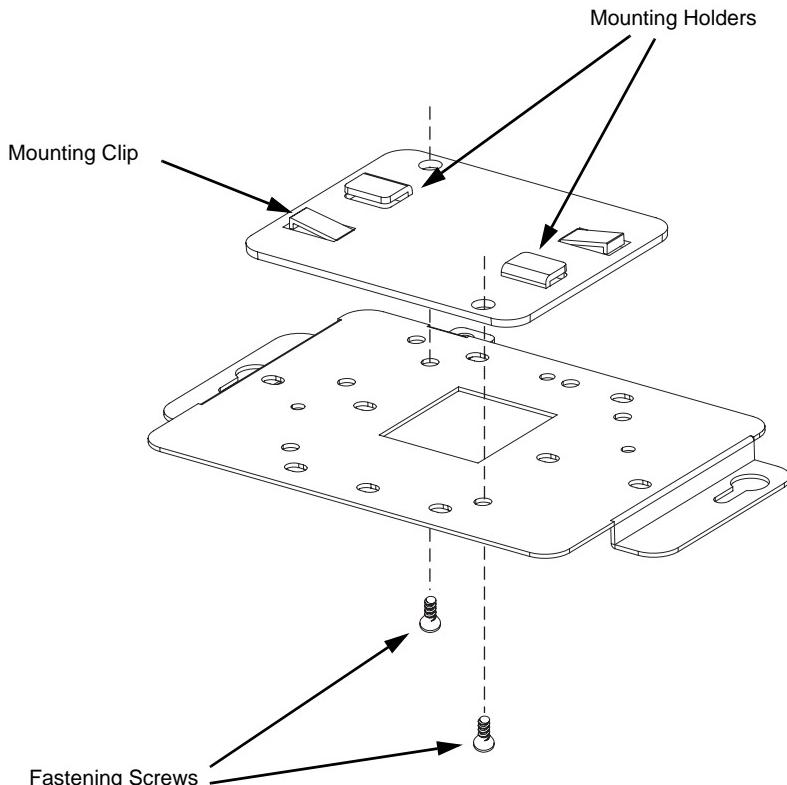
axes, providing the same coverage. For example, if the access point is mounted on a horizontal surface, both antennas should be positioned pointing vertically up to provide optimum coverage.

## Attaching the Access Point to a Suspended Ceiling

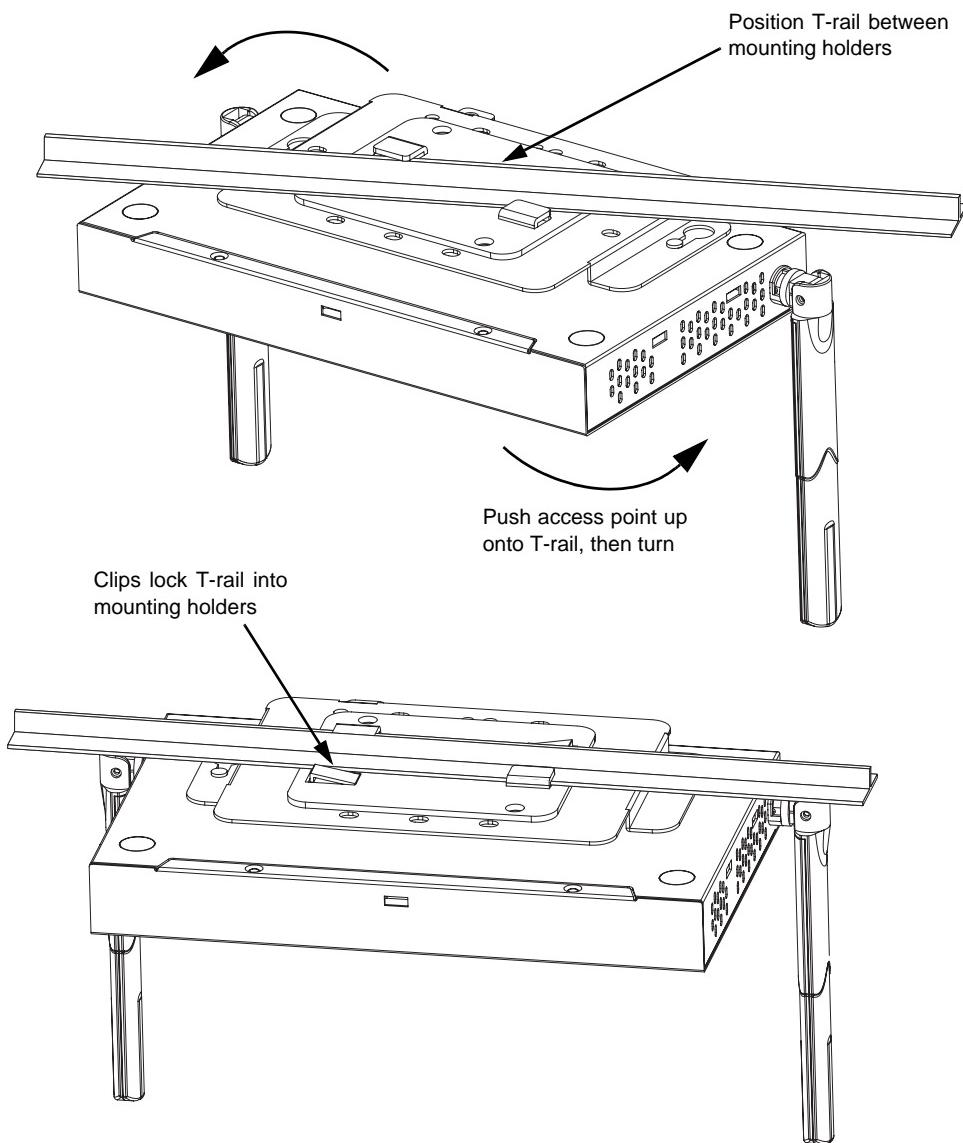
To mount the access point to a suspended ceiling T-rail (Figure 4-4), do the following:

1. Attach the plastic ceiling tile mounting clamp to the mounting bracket (Figure 4-3) using the two included screws. Note that the ceiling-mount clamp can be attached to the bracket in two orientations.

**Figure 4-3. Attaching the Ceiling-Mount Clamp to the Mounting Bracket**



2. Attach the access point to the mounting bracket by aligning the two mounting points on the bracket with the two mounting slots on the bottom of the access point (Figure 4-2). Then screw down the fastening screw to secure the access point to the bracket.
3. Choose a location on a ceiling T-rail where the access point will be installed and position the ceiling-mount clamp holders on either side of the T-rail.
4. Turn the access point until the two clips lock the T-rail into the mounting holders.
5. For best coverage, position the antennas along the same axes.

**Figure 4-4. Attaching the Bracket to a Suspended Ceiling**

### Locking the Access Point

To prevent unauthorized removal of the access point, you can use a Kensington Slim MicroSaver security cable (not included) to attach the access point to a fixed object.

### Installing an External Antenna

You can install an external antenna to extend the access point's coverage area. If you install the external antenna while live sessions are on the access point, those sessions will be terminated.

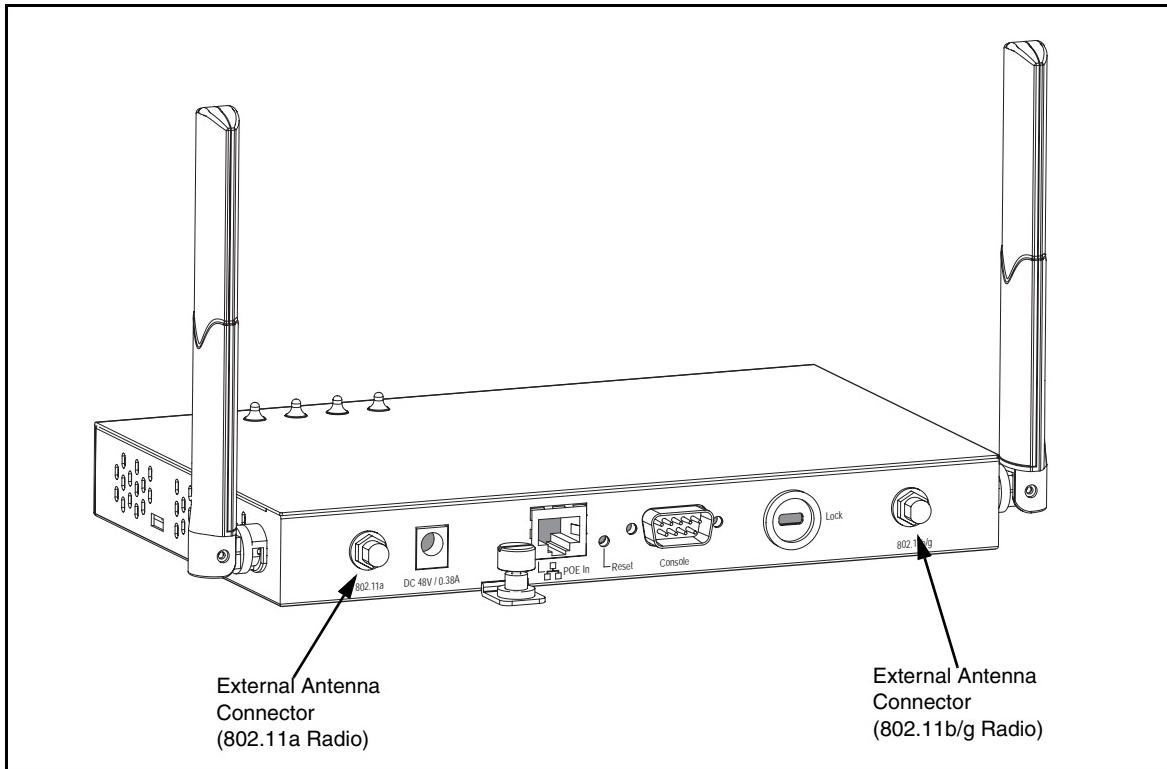
**Professional Installed Device — Must not be distributed through retail stores:** You must use the appropriate antennas, cables, and where applicable, surge arrestors, for your given region. You are responsible for verifying local regulations or legislation that may impose restrictions on the use of

specific antenna and cable combinations. For this reason, you must consult with a professional installer who is trained in RF installation and knowledgeable in the local regulations prior to connecting an external antenna to your wireless radio product. It is the responsibility of the end user to ensure that the antenna installation complies with the local radio regulations.

To install an external antenna:

1. Connect the external antenna's Reverse SMA connector to the access point's external antenna connector. Connect 2.4 GHz antennas to the connector labeled "802.11b/g" and 5.0 GHz antennas to the connector labeled "802.11a."

**Figure 4-5. Connecting the External Antenna**



2. Set the Antenna Mode for the radio interface to "external" using the CLI or Web interface.
3. Enable the radio interface using the CLI or Web interface.

## Powering Up the Access Point

Prepare the access point for power up by doing the following:

1. Connect the RS-232 console cable to the access point's console port.

**Note:** The IronPoint access point also supports power over Ethernet (PoE) to obtain its power from the RJ-45 port.

2. Connect the other end of the RS-232 console cable to your PC's serial port.

3. On your PC console application configure the following communication parameters:
  - 9600 bits per second
  - 8 data bits
  - No parity
  - 1 stop bits
  - No Flow Control
4. Connect the power adapter cable to the 48V DC power socket on the access point and the other end of the cable to a power source.

---

**CAUTION:** Use ONLY the power adapter supplied with this access point. Otherwise, the product may be damaged.

---

## Adding the IronPoint Access Point to the Network

The access point's country code and TCP/IP address information must be configured before an access point can be managed or added to a network. Configuring the correct country code allows the access point to use the necessary channels and frequencies assigned to your country's wireless frequency regulations. This must be done prior to using the access point for the first time as the 802.11a and 802.11b/g radios cannot be enabled until the country code has been configured.

---

**Note:** Country regulations for wireless products differ from country to country. The access points may be shipped with the country code already preset, as required by the country, or set to the default setting of "99." If your country code is pre-set (for example, for United States, Canada, Japan, and New Zealand), you are prohibited from changing this setting. If country code on your access point is set to "99," then you may set the country code, but you can set it only to the country in which the access point is to be used.

It is very important to follow these instructions carefully. Selection of the wrong country code for your device could result in the device operating outside of authorized frequency/power allocations and lead to possible legal action by the regulatory authority in your country.

Although Foundry has attempted to provide accurate information in these materials, Foundry assumes no legal responsibility for the accuracy or completeness of the information. Please note that Foundry's product information does not constitute or contain any guarantee, warranty or legally binding representation, unless expressly identified as such in a duly signed writing.

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Foundry's IronPoint access point uses TCP/IP to communicate with the management consoles. By using TCP/IP, you can place access points anywhere in the enterprise and manage them from a single central location. IronPoint access points do not need to be physically connected to any wireless LAN switch to be managed.

You can configure the access point's TCP/IP address information using the Automatic Discovery and Configuration (ADC) or without using ADC. ADC allows you to rapidly configure a number of access points, straight out of the box, by mapping an access point's MAC address to an IP address, subnet mask, and default gateway that are defined on an IronPoint-FES interface. Once the access point is

attached to the IronPoint-FES, the switch assigns the predefined IP address, subnet mask, and default gateway to the access point with the matching MAC address.

The IronPoint 250 is shipped with the ADC feature enabled. If you want to use ADC to configure TCP/IP address information, refer to the *Foundry IronPoint Wireless LAN Configuration Guide for the IronPoint-FastIron Edge Switch* for details.

If you do not want to use ADC, you must override ADC at power-up, so you can enter TCP/IP information. Do the following:

1. Once the access point powers up, a prompt to override ADC appears. Enter the following ADC override login ID and password on your PC console to override ADC:

```
ADC-Override-Login: admin  
ADC-Override-Password: admin
```

2. Enter the default administrator user name and password on to gain access to the CLI:

```
Username: admin  
Password: admin
```

3. Disable ADC by entering the following command:

```
Foundry AP#configure  
Foundry AP(config)#no adc enable  
Foundry AP(config)#end
```

---

**Note:** If you do not disable ADC, the ADC-Override Login prompt will keep appearing every time the access point reboots.

---

4. Set the correct country code with the country command. For example, to set the country code to the United Kingdom, enter:

```
Foundry AP#country <country_code>  
Foundry AP# country ?
```

The list of supported countries and their codes is displayed:

```
WORD Country code: AL-ALBANIA, DZ-ALGERIA, AR-ARGENTINA, AM-ARMENIA,  
AU-AUSTRALIA, AT-AUSTRIA, AZ-AZERBAIJAN, BH-BAHRAIN, BY-BELARUS,  
BE-BELGIUM, BZ-BELIZE, BO-BOLIVIA, BR-BRAZIL, BN-BRUNEI_DARUSSALAM,  
BG-BULGARIA, CA-CANADA, CL-CHILE, CN-CHINA, CO-COLOMBIA, CR-COSTA_RICA,  
HR-CROATIA, CY-CYPRUS, CZ-CZECH_REPUBLIC, DK-DENMARK,  
DO-DOMINICAN_REPUBLIC, EC-ECUADOR, EG-EGYPT, EE-ESTONIA, FI-FINLAND,  
FR-FRANCE, GE-GEORGIA, DE-GERMANY, GR-GREECE, GT-GUATEMALA,  
HK-HONG_KONG, HU-HUNGARY, IS-ICELAND, IN-INDIA, ID-INDONESIA, IR-IRAN,  
IE-IRELAND, IL-ISRAEL, IT-ITALY, JP-JAPAN, JO-JORDAN, KZ-KAZAKHSTAN,  
KP-NORTH_KOREA, KR-KOREA_REPUBLIC, KW-KUWAIT, LV-LATVIA, LB-LEBANON,  
LT-LIECHTENSTEIN, LU-LUXEMBOURG, MO-MACAU, MK-MACEDONIA,  
MY-MALAYSIA, MX-MEXICO, MC-MONACO, MA-MOROCCO, NL-NETHERLANDS,  
NZ-NEW_ZEALAND, NO-NORWAY, OM-OMAN, PK-PAKISTAN, PA-PANAMA, PE-PERU,  
PH-PHILIPPINES, PL-POLAND, PT-PORTUGAL, PR-PUERTO_RICO, QA-QATAR,  
RO-ROMANIA, RU-RUSSIA, SA-SAUDI_ARABIA, SG-SINGAPORE,  
SK-SLOVAK_REPUBLIC, SI-SLOVENIA, ZA-SOUTH_AFRICA, ES-SPAIN, SE-SWEDEN,  
CH-SWITZERLAND, SY-SYRIA, TW-TAIWAN, TH-THAILAND, TR-TURKEY,  
UA-UKRAINE, AE-UNITED_ARAB_EMIRATES, GB-UNITED KINGDOM,
```

US-UNITED\_STATES, UY-URUGUAY, VE-VENEZUELA, VN-VIETNAM

5. Configure the TCP/IP address. The default IP address for the access point is 169.254.1.1 with a 255.255.0.0 subnet mask and a default gateway of 169.254.1.254. To change the access point's IP address, for example, to 192.168.1.10 with a 24-bit subnet mask and a default gateway of 192.168.1.254, enter:

```
Foundry AP#configure
Foundry AP(config)#interface ethernet
Foundry AP(if-ethernet)#ip address 192.168.1.10 255.255.255.0 192.168.1.254
Foundry AP(if-ethernet)#end
Foundry AP #
```

**Syntax:** interface ethernet

```
ip address <ip-address> <subnet-mask> <default-gateway>
```

6. Confirm the Country Code and TCP/IP settings with the **show system** command. Do not proceed unless the information displayed is correct. For example, to confirm the country code of the United Kingdom and the TCP/IP address of 192.168.8.10/24, enter:

```
Foundry AP # show system
```

**Syntax:** show system

The command displays the following information:

```
Foundry AP # show system

System Information
=====
Serial Number      : SACC1200KA
System Up time    : 0 days, 0 hours, 5 minutes, 25 seconds
System Name       : Foundry AP
System Location   :
System Contact    : Contact
System Country Code: GB - UNITED KINGDOM
MAC Address       : 00-0C-DB-813-882
IP Address        : 192.168.8.10
Subnet Mask       : 255.255.255.0
Default Gateway   : 192.168.8.254
VLAN State        : DISABLED
Management VLAN ID(AP): 1
IAPP State        : ENABLED
DHCP Client       : DISABLED
HTTP Server       : ENABLED
HTTP Server Port  : 80
HTTPS Server      : ENABLED
HTTPS Server Port : 443
Slot Status       : Dual band(a/g)
Software Version  : 01.2.03.00Tw8
SSH Server        : ENABLED
SSH Server Port   : 22
Telnet Server     : ENABLED
=====
```

7. Power down the access point.
8. Connect one end of the Ethernet cable to the RJ-45 connector on the access point.

9. Connect the other end of the cable to the network subnet for which the access point was programmed.
10. Power up the access point. It can now be managed using its command line interface (CLI) or Web interface.

Once the access point is set up with country code and IP address, other parameters can be defined using one of the following methods:

- A PC running Internet Explorer version 5.0 (and above) or Firefox Web browser to directly access an individual Foundry AP's internal Web management interface.
- A Telnet or SSH v2 client to directly access Foundry AP's command line interface (CLI).

Refer to the *Foundry IronPoint Access Point User Guide* for details.

# Chapter 5

## Making a Network Connection

### Connecting to a Network Device

The IronPoint 250 is designed to connect a wired Ethernet network to wireless clients. It can be connected to any Ethernet network device, such as a hub or switch.

---

**CAUTION:** The IronPoint 250 is only intended for installation in Environment A as defined in IEEE 802.3af. All interconnected equipment must be contained within the same building, including the interconnected equipment's associated LAN connection.

---

### Twisted-Pair Cable

The access point's Ethernet port connection requires an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. For 100BASE-TX connections, Category 5 or better cable is required; for 10BASE-T, Category 3 or better cable can be used.

#### Cabling Guidelines

The RJ-45 port on the access point supports automatic MDI/MDI-X operation, so you can use straight-through cables for all network connections to PCs, switches, or hubs.

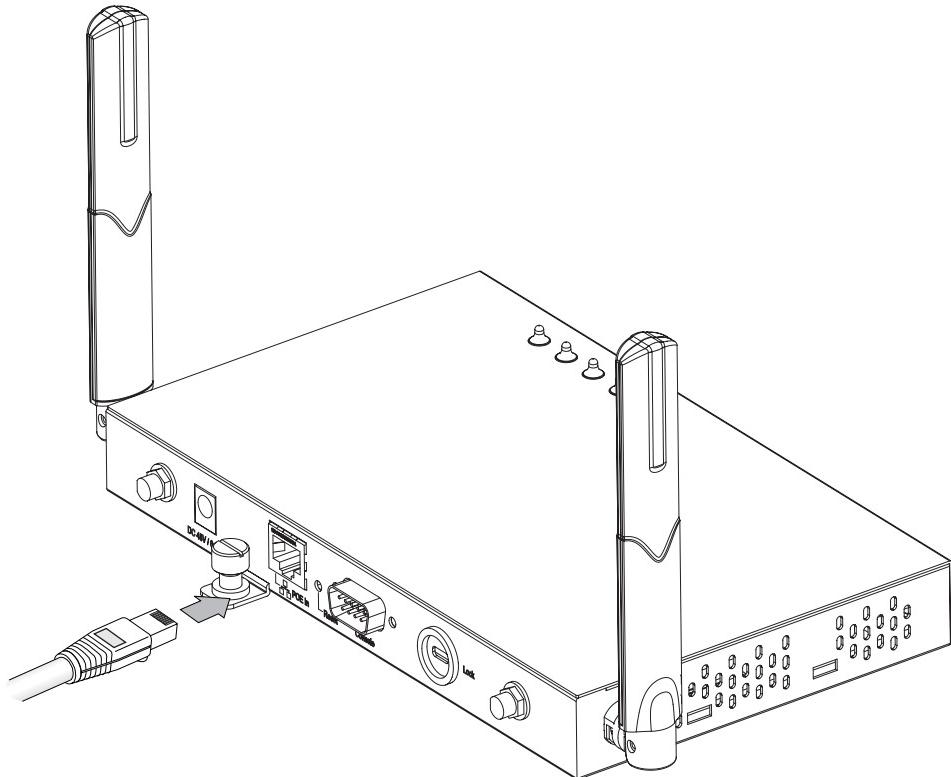
See Appendix B for further information on cabling.

**Caution:** Do not plug a phone jack connector into the RJ-45 port. This will damage the access point. Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

## Connecting to a Switch, Hub, PC, or Server

1. Attach one end of a twisted-pair cable segment to the network device's RJ-45 connector.

**Figure 5-1. Connecting to a Network Device**



2. Attach the other end of the cable segment to the Ethernet port on the access point.

---

**Note:** Make sure the twisted pair cable does not exceed 100 meters (328 ft) in length.

---

3. As the connection is made, the access point's Link LED should light indicating a valid network connection. If the Link LED fails to light, see Appendix A for troubleshooting information.

# Appendix A

## Troubleshooting

### Diagnosing Access Point Indicators

Troubleshooting Chart	
Symptom	Action
Status LED is Off	<ul style="list-style-type: none"><li>External power supply may be disconnected. Check connections between the access point, the power adapter, and the wall outlet.</li><li>If using PoE, verify that access point's RJ-45 port is attached to a PoE source device, that the PoE source device is powered on, and that PoE power is enabled on the port attached to the access point.</li><li>Contact Technical Support.</li></ul>
Link LED is Off	<ul style="list-style-type: none"><li>Verify that the access point and attached device is powered on.</li><li>Be sure the cable is plugged into both the access point and corresponding device.</li><li>Verify that the proper cable type is used and its length does not exceed specified limits.</li><li>Check the cable connections for possible defects. Replace the cable if necessary.</li></ul>

### Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (such as the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

### Console Access

If you cannot access the command line interface via a serial port connection, check the following items before you contact Technical Support:

- Be sure you have set the terminal emulator program to VT100 compatible, 8 data bits, 1 stop bit, no parity and 9600 bps.
- Check that the serial cable conforms to the pin-out connections provided in Appendix B.

## In-Band Access

If the access point cannot be configured using the CLI via Telnet or SSH v2, a Web browser using HTTP or HTTPS, or SNMP v2 or v3 software, check the following items before you contact Technical Support.

If the access point cannot be configured using the CLI via Telnet, a Web browser, or SNMP software, check the following items before you contact Technical Support:

- Be sure to have configured the access point with a valid IP address, subnet mask and default gateway.
- If VLANs are enabled on the access point, the management station should be configured to send tagged frames with a VLAN ID that matches the access point's native VLAN (default VLAN 1). However, to manage the access point from a wireless client, the AP Management Filter should be disabled.
- Check that you have a valid network connection to the access point and that the Ethernet port or the wireless interface that you are using has not been disabled.
- If you are connecting to the access point through the wired Ethernet interface, check the network cabling between the management station and the access point. If you are connecting to access point from a wireless client, ensure that you have a valid connection to the access point.
- If you cannot connect using Telnet, you may have exceeded the maximum number of concurrent Telnet sessions permitted (i.e, four sessions). Try connecting again at a later time.

## Wireless Client Network Access

If wireless clients cannot access the network, check the following before you contact Technical Support:

- Be sure the access point and the wireless clients are configured with the same Service Set ID (SSID).
- If authentication or encryption are enabled, ensure that the wireless clients are properly configured with the appropriate pre-shared key, authentication, or encryption keys. The wireless client's NIC must have the necessary drivers to support the security and authentication methods configured on the access point.
- If authentication is being performed through a RADIUS server, ensure that the clients are properly configured on the RADIUS server.
- If authentication is being performed through IEEE 802.1x, be sure the wireless users have installed and properly configured 802.1x client software.
- If MAC address filtering is enabled, be sure the client's address is included in the local filtering database or on the RADIUS server database.
- If the wireless clients are roaming between access points, make sure that all the access points and wireless devices in the Extended Service Set (ESS) are configured to the same SSID, and authentication method.

- Check the configuration matrix for the most commonly used authentication and encryption combinations in the *Quick Installation and Getting Started Guide* to ensure that the access point is correctly configured.

## Lost Password

The only way to recover a lost password is by setting the access point to its default configuration. Refer to the section “Reset the Access Point Default Settings” for instructions.

## Reset the Access Point Default Settings

If all other recovery measures fail and the access point is still not functioning properly, take any of these steps:

- Reset the access point’s hardware using the console interface, Web interface, or through a power reset.
- Reset the access point to its default configuration by pressing the reset button on the back panel for 5 seconds or more. Then use the default user name “admin” with the password “admin” to access the management interface.



## Appendix B Cables

### Specifications

Cable Types and Specifications			
Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3 or better 100-ohm UTP	100 m (328 ft)	RJ-45
100BASE-TX	Cat. 5 or better 100-ohm UTP	100 m (328 ft)	RJ-45

### Twisted-Pair Cable and Pin Assignments

---

**CAUTION:** DO NOT plug a phone jack connector into any RJ-45 port. Use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

---

For 100BASE-TX/10BASE-T connections, a twisted-pair cable must have two pairs of wires. Each wire pair is identified by two different colors. For example, one wire might be green and the other, green with white stripes. Also, an RJ-45 connector must be attached to both ends of the cable.

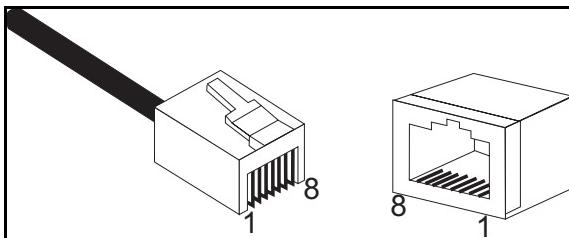
---

**CAUTION:** Each wire pair must be attached to the RJ-45 connectors in a specific orientation.

---

Figure B-1 illustrates how the pins on the RJ-45 connector are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

**Figure B-1. RJ-45 Connector Pin Numbers**



## 100BASE-TX/10BASE-T Pin Assignments

Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100-ohm Category 3 or better cable for 10 Mbps connections, or 100-ohm Category 5 or better cable for 100 Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).

The RJ-45 port on the access point supports automatic MDI/MDI-X operation, so you can use straight-through or crossover cables for all network connections to PCs, switches, or hubs.

Pin	MDI Signal Name	MDI-X Signal Name
1	Receive Data plus (RD+) and GND (Positive V <sub>port</sub> )	Transmit Data plus (TD+) and -48V feeding power (Negative V <sub>port</sub> )
2	Receive Data minus (RD-) and GND (Positive V <sub>port</sub> )	Transmit Data minus (TD-) and -48V feeding power (Negative V <sub>port</sub> )
3	Transmit Data minus (TD+) and -48V feeding power (Negative V <sub>port</sub> )	Receive Data plus (RD+) and GND (Positive V <sub>port</sub> )
4	GND (Positive V <sub>port</sub> )	-48V feeding power (Negative V <sub>port</sub> )
5	GND (Positive V <sub>port</sub> )	-48V feeding power (Negative V <sub>port</sub> )
6	Transmit Data minus (TD-) and -48V feeding power (Negative V <sub>port</sub> )	Receive Data minus (RD-) and GND (Positive V <sub>port</sub> )
7	-48V feeding power (Negative V <sub>port</sub> )	GND (Positive V <sub>port</sub> )
8	-48V feeding power (Negative V <sub>port</sub> )	GND (Positive V <sub>port</sub> )

**Note:** The “+” and “-” signs represent the polarity of the wires that make up each wire pair.

## Straight-Through Wiring

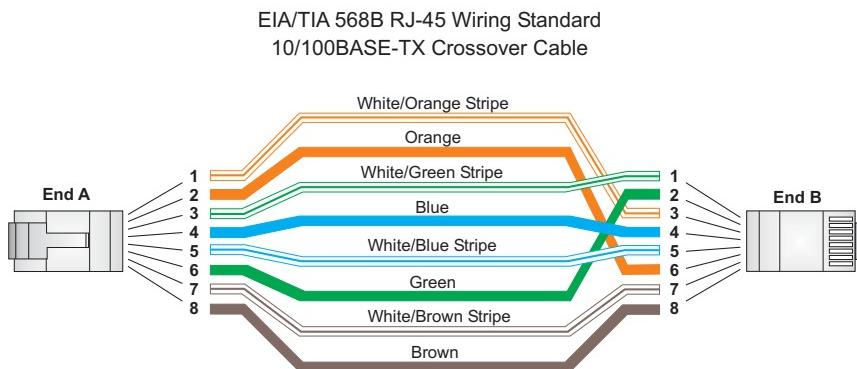
Because the 10/100 Mbps port on the access point uses automatic MDI/MDI-X pin configuration, you can use “straight-through” or “crossover” cable for network connections to PCs, hubs or switches.

**Figure B-2. Straight-Through Wiring**



## Crossover Wiring

Because the 10/100 Mbps port on the access point uses automatic MDI/MDI-X pin configuration, you can use “straight-through” or “crossover” cable for network connections to PCs, hubs or switches.

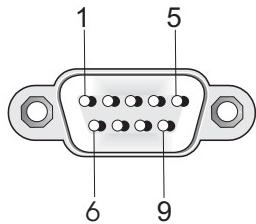
**Figure B-3. Crossover Wiring**

## Console Port Pin Assignments

The DB-9 serial port on the IronPoint 250 is used to connect to the access point for out-of-band management. The access point's command-line interface can be accessed from a terminal or a PC running a terminal emulation program.

Connect the console cable (included) to the RS-232 console port to access the command-line interface. You can manage the access point using the console port, the Web interface, or SNMP management software. Refer to the *Foundry IronPoint Access Point User Guide* for more information.

The pin assignments used to connect to the console port are described in the following figure and table.

**Figure B-4. Serial Port (DB-9 DTE) Pin-Out**

## Wiring Map for Serial Cable

Signal (access point serial port)	Null Modem Cable	Signal (management console port)
2 RXD (receive data)	<-----RXD ----->	3 TXD (transmit data)
3 TXD (transmit data)	-----TXD ----->	2 RXD (receive data)
5 GND (ground)	-----GND ----->	5 GND (ground)
1,4,6,7,8,9 Unused		1,4,6,7,8,9 Unused

**Note:** The left hand column pin assignments are for the male DB-9 connector on the access point. Pin 3 (TXD or "transmit data") must emerge on the management console's end of the connection as RXD ("receive data").

The serial port's configuration requirements are as follows:

- Default Baud rate—9,600 bps
- Character Size—8 Characters
- Parity—None
- Stop bit—One
- Data bits—8

# Appendix C Specifications

## General Specifications

### Maximum Channels

802.11a:

US & Canada: 10 (normal mode), 3 (turbo mode)  
Japan: 4 (normal mode), 1 (turbo mode)  
ETSI: 4 channels (normal mode), 1 (turbo mode)  
Taiwan: 4 (normal mode), 1 (turbo mode)

802.11g:

FCC/IC: 1-11  
ETSI: 1-13  
France: 10-13  
MKK: 1-14  
Taiwan: 1-11

### Maximum Clients

64 per VAP interface

### Operating Range

See "Maximum Distance Tables" on page C-5."

### Data Rate

802.11a:

Normal Mode: 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel  
Turbo Mode: 12, 18, 24, 36, 48, 72, 96, 108 Mbps per channel

802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel

802.11b: 1, 2, 5.5, 11 Mbps per channel

### Modulation Type

802.11a: BPSK, QPSK, 16-QAM, 64-QAM

802.11g: CCK, BPSK, QPSK, OFDM

802.11b: CCK, BPSK, QPSK

### Network Configuration

Infrastructure

### Operating Frequency

802.11a:

5.15 ~ 5.25 GHz (lower band) US/Canada, Japan  
5.725 ~ 5.825 GHz (upper band) US/Canada

5.50 ~ 5.70 GHz Europe  
5.25 ~ 5.35 GHz (middle band) Taiwan  
5.725 ~ 5.825 GHz (high band) Taiwan

802.11b/g:  
2.4 ~ 2.4835 GHz (US, Canada, ETSI)  
2.4 ~ 2.497 GHz (Japan)  
2.400 ~ 2.4835 GHz (Taiwan)

#### **AC Power supply**

Input: 100-240 VAC, 50-60 Hz  
Output: 48 VDC, 0.38 A

#### **Unit Power Supply**

DC Input: 48 VDC, 0.38 A maximum  
Input voltage: 48 volts, 0.27 A, 12.95 watts  
Power consumption: 9.6 watts maximum

#### **PoE (DC)**

Input voltage: -48 VDC, 0.27 A, 12.96 watts

---

**Note:** Power can also be provided to the access point through the Ethernet port based on IEEE 802.3af Power over Ethernet (PoE) specifications. When both PoE is provided and the AC adapter is plugged in, power will taken from the PoE source.

---

#### **Physical Size**

21.83 x 13.73 x 3.27 cm (8.60 x 5.40 x 1.29 in)

#### **Weight**

0.687 kg (1.514 lbs)

#### **LED Indicators**

Status (power), Ethernet (link/activity), Radio a  
and Radio b/g (wireless link/activity)

#### **Network Management**

Web-browser, RS232 console, Telnet, SSH, SNMP

#### **Temperature**

Operating: -5 to 50 °C (23 to 122 °F)

Storage: 0 to 70 °C (32 to 158 °F)

#### **Humidity**

15% to 95% (non-condensing)

#### **EMC Certification**

FCC Part 15. Subpart B (Class B)

EN 55022 (CE mark) (Class B)

EN 55024 (CE mark) (Immunity) for Information Technology Equipment

ICES-003 (Canada) (Class B)

AS/NZ 55022 (Australia) (Class B)

VCCI (Japan) (Class B)

EN 61000-3-2

EN 61000-3-3

EN 61000-6-1

**Radio Signal Certification**

FCC Part 15, Subpart C - Intentional Radiators 15.247, 15.207, 15.407

RSS-210 (Canada)

RSS-102 (Canada)

EN 300 328, EN 300 893, EN 301 489 (Sections 1-17, as necessary) (Europe)

ARIB STD 33 (Japan)

ARIB STD 66 (Japan)

ARIB STD T71 (Japan)

AS/NZS 4771, 4628.2 (Australia and New Zealand)

**Safety**

UL/CUL (CSA 22.2 No. 60950-1 & UL60950-1)

EN 60950-1 (TÜV/GS)

IEC 60950-1 (CB)

**Standards**

IEEE 802.3-2005

IEEE 802.11a, b, g

## Sensitivity

<b>IEEE 802.11a</b>	<b>Sensitivity (GHz - dBm)</b>			
<b>Modulation/Rates</b>	<b>5.15-5.250</b>	<b>5.25-5.350</b>	<b>5.50-5.700</b>	<b>5.725-5.825</b>
BPSK (6 Mbps)	-88	-88	-88	-88
BPSK (9 Mbps)	-87	-87	-87	-87
QPSK (12 Mbps)	-86	-86	-86	-86
QPSK (18 Mbps)	-83	-83	-83	-83
16 QAM (24 Mbps)	-80	-80	-80	-80
16 QAM (36 Mbps)	-76	-76	-76	-76
64 QAM (48 Mbps)	-73	-73	-73	-73
64QAM(54 Mbps)	-70	-70	-70	-70

<b>IEEE 802.11g</b>	
<b>Data Rate</b>	<b>Sensitivity (dBm)</b>
6 Mbps	-88
9 Mbps	-86
12 Mbps	-85
17 Mbps	-84
24 Mbps	-80
36 Mbps	-76
48 Mbps	-73
54 Mbps	-70

<b>IEEE 802.11b</b>	
<b>Data Rate</b>	<b>Sensitivity (dBm)</b>
1 Mbps	-90
2 Mbps	-89
5.5 Mbps	-87
11 Mbps	-85

## Maximum Distance Tables

### Important Notice

The operating range distances listed in the following tables are for typical environments only. Operating ranges can vary considerably depending on factors such as local interference and barrier composition. It is recommended to do a site survey to determine the maximum ranges for specific access point locations in your environment.

802.11a Wireless Distance Table								
Environment	Speed and Distance Ranges							
	54 Mbps	48 Mbps	36 Mbps	24 Mbps	18 Mbps	12 Mbps	9 Mbps	6 Mbps
Office	27 m 89 ft	40 m 132 ft	46 m 152 ft	55 m 182 ft	60 m 198 ft	66 m 218 ft	76 m 251 ft	80 m 264 ft

802.11b Wireless Distance Table				
	Speed and Distance Ranges			
Environment	11 Mbps	5.5 Mbps	2 Mbps	1 Mbps
Office	70 m 230 ft	75 m 246 ft	85 m 279 ft	85 m 279 ft

802.11g Wireless Distance Table												
Environment	Speed and Distance Ranges											
	54 Mbps	48 Mbps	36 Mbps	24 Mbps	18 Mbps	12 Mbps	11 Mbps	9 Mbps	6 Mbps	5 Mbps	2 Mbps	1 Mbps
Office	43 m 141 ft	50 m 164 ft	57 m 187 ft	63 m 207 ft	67 m 220 ft	71 m 233 ft	75 m 246 ft	77 m 253 ft	81 m 266 ft	85 m 279 ft	85 m 279 ft	85 m 279 ft

**Note:** Office Environment: A typical office or home environment with floor to ceiling obstructions between the access point and clients.



## Appendix D

# Cautions and Warnings

The cautions and warnings that appear in this manual are listed below in English, German, French, and Spanish.

### Cautions

A caution calls your attention to a possible hazard that can damage equipment.

"Vorsicht" weist auf die Gefahr einer möglichen Beschädigung des Gerätes in.

Une mise en garde attire votre attention sur un risque possible d'endommagement de l'équipement. Ci-dessous, vous trouverez les mises en garde utilisées dans ce manuel.

Un mensaje de precaución le advierte sobre un posible peligro que pueda dañar el equipo. Las siguientes son precauciones utilizadas en este manual.

---

**CAUTION:** Use only the power adapter supplied with the access point. Otherwise, the product may be damaged.

**VORSICHT:** Nur der mit dem Access Point mitgelieferte Netzstromadapter darf verwendet werden. Andernfalls kann das Produkt Schaden davontragen.

**MISE EN GARDE:** Utiliser uniquement l'adaptateur secteur fourni avec le point d'accès, faute de quoi le produit risque d'être endommagé.

**PRECAUCIÓN:** Utilice solamente el adaptador de alimentación suministrado con el punto de acceso. De otro modo, el producto podría resultar dañado.

---

**CAUTION:** Do not plug a phone jack connector into any RJ-45 port. Use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

**VORSICHT:** Keinen Telefonstecker an einer RJ-45-Schnittstelle anschließen. Nur TP (Twisted Pair)-Kabel mit RJ-45-Konnektoren, die FCC-Normen entsprechen, verwenden.

**MISE EN GARDE:** Ne pas tenter de brancher un connecteur différent du modèle RJ-45 dans un port RJ-45. Utiliser uniquement à cet effet des câbles en paires torsadées dotés de connecteurs RJ-45 conformes aux standards de la FCC.

---

**PRECAUCIÓN:** No enchufe una clavija de teléfono en un puerto RJ-45. Utilice solamente cables de par trenzado con conectores RJ-45 que se ajusten a la normativa FCC.

---

**CAUTION:** Each wire pair must be attached to the RJ-45 connector in a specific orientation.

**VORSICHT:** Jedes Leiterpaar muss in einer bestimmten Ausrichtung am RJ-45-Anschluss angeschlossen werden.

**MISE EN GARDE:** Le connecteur RJ-45 d'un câble en paires torsadées correspond à un câblage et à un positionnement précis.

**PRECAUCIÓN:** Cada par de cables debe acoplarse al conector RJ-45 conforme a una determinada orientación.

---

**CAUTION:** When mounting the access point on a wall or suspended ceiling, use PoE power ONLY. Do not use the AC power adapter.

**VORSICHT:** Bei Installation des Access Point an einer Wand oder einem Hängeboden darf NUR PoE (Power over Ethernet)-Strom verwendet werden. Keinen Wechselstromadapter verwenden.

**MISE EN GARDE:** En cas de montage du point d'accès sur un mur ou en plafond suspendu, utiliser UNIQUEMENT une alimentation en PoE (Power over Ethernet). Ne pas utiliser l'adaptateur secteur.

**PRECAUCIÓN:** Al montar el punto de acceso en una pared o techo, utilice alimentación por Ethernet (PoE) SOLAMENTE. No utilice el adaptador de alimentación de CA.

---

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<b>CAUTION:</b>	The IronPoint 250 is only intended for installation in Environment A as defined in IEEE 802.3af. All interconnected equipment must be contained within the same building, including the interconnected equipment's associated LAN connection.
<b>VORSICHT:</b>	IronPoint 250 ist nur zur Installation in einer Umgebung A, wie in IEEE 802.3af definiert, bestimmt. Alle verbundenen Geräte müssen sich im gleichen Gebäude befinden, einschließlich der zugehörige LAN-Anschluss der verbundenen Geräte.
<b>MISE EN GARDE:</b>	Le modèle IronPoint 250 est uniquement destiné à une installation en environnement A, comme défini dans la norme IEEE 802.3af relative à l'alimentation par câble Ethernet. Tous les équipements interconnectés doivent se trouver dans le même bâtiment, y compris les connexions au réseau local qui leur sont associées.
<b>PRECAUCIÓN:</b>	El punto IronPoint 250 está diseñado exclusivamente para su instalación en un Entorno A, conforme éste aparece definido en la norma IEEE 802.3af. Todo el equipo interconectado debe estar contenido en el mismo edificio, incluyendo la conexión LAN asociada.

---

## Warnings

A warning calls your attention to a possible hazard that can cause injury or death. The following are the warnings used in this manual.

"Achtung" weist auf eine mögliche Gefährdung hin, die zu Verletzungen oder Tod führen können. Sie finden die folgenden Warnhinweise in diesem Handbuch:

Un avertissement attire votre attention sur un risque possible de blessure ou de décès. Ci-dessous, vous trouverez les avertissements utilisés dans ce manuel.

Una advertencia le llama la atención sobre cualquier posible peligro que pueda ocasionar daños personales o la muerte. A continuación se dan las advertencias utilizadas en este manual.

---

**WARNING:** This product is suitable for use in environmental air space in accordance with the Section 300-22(c) of the National Electric Code and Sections 2- 128.12 - 010 (3) and 12 - 100 of the Canadian Electrical Code. Part 1. C22. 1. For other countries, consult local authorities for regulations.

**ACHTUNG!** Dieses Produkt zur Verwendung in einem Umgebungsluftraum gemäß Abschnitt 300-22(c) des National Electric Code und Abschnitt 2- 128.12 - 010 (3) und 12 - 100 des Canadian Electrical Code Teil 1. C22.1 geeignet. Die Vorschriften für andere Länder sind bei den örtlichen Behörden erhältlich.

**AVERTISSEMENT** Cet appareil est adapté à une utilisation dans les vides de construction des bâtiments selon la section 300-22(c) du code NEC (National Electric Code) et les sections 2- 128.12 - 010 (3) et 12 - 100 du Code électrique du Canada, partie 1. C22. 1. Pour tous les autres pays, consulter les organismes de réglementation locaux.

**ADVERTENCIA** Este producto es adecuado para su uso en el espacio aéreo circundante en conformidad con la sección 300-22(c) del National Electric Code (Código Eléctrico Nacional de EE.UU.) y las secciones 2- 128.12 - 010 (3) y 12 - 100 del Código Eléctrico de Canadá. Parte 1. C22. 1. En otros países, consulte a las autoridades locales competentes para informarse acerca de las normativas vigentes.

---

**WARNING:** Any Fast Ethernet (FE) cables installed in air-handling spaces should be suitable under NEC Article 800.50 and marked accordingly for use in plenums and air-handling spaces with regard to smoke propagation, such as CL2-P, CL3-P, MPP (Multi Purpose Plenum), or CMP (Communications Plenum).

**ACHTUNG!** Alle Fast-Ethernet (FE)-Kabel, die in Lüftungsräumen installiert werden, sollten gemäß NEC Artikel 800.50 geeignet sein und entsprechend zur Verwendung in Hohlräumen (Plenum) und Lüftungsräumen im Hinblick auf Rauchausbreitung gekennzeichnet sein, z.B. CL2-P, CL3-P, MPP (Multi Purpose Plenum) oder CMP (Communications Plenum).

**AVERTISSEMENT** Les câbles Fast Ethernet (FE) installés dans un vide d'air doivent correspondre aux critères de l'article 800.50 du code NEC et identifiés en conséquence comme adaptés à une utilisation dans les vides de construction des bâtiments en matière de propagation de la fumée (marquages CL2-P, CL3-P, MPP (Multi Purpose Plenum) ou CMP (Communications Plenum)).

**ADVERTENCIA** Todos los cables Fast Ethernet (FE) instalados en espacios aéreos deben cumplir con el artículo 800.50 del NEC y estar marcados adecuadamente para su uso en espacios aéreos y plenums en lo concerniente a la propagación de humo, tales como CL2-P, CL3-P, MPP (Plenum multifuncional), o CMP (Plenum de comunicaciones).

---

# Glossary

## **10BASE-T**

IEEE 802.3 specification for 10 Mbps Ethernet over two pairs of Category 3 or better UTP cable.

## **100BASE-TX**

IEEE 802.3u specification for 100 Mbps Fast Ethernet over two pairs of Category 5 or better UTP cable.

## **Access Point**

An internetworking device that seamlessly connects wired and wireless networks. Access points attached to a wired network, support the creation of multiple radio cells that enable roaming throughout a facility.

## **Ad Hoc**

A group of computers connected as an independent wireless network, without an access point.

## **Authentication**

The process to verify the identity of a client requesting network access. IEEE 802.11 specifies two forms of authentication: open system and shared key.

## **Backbone**

The core infrastructure of a network. The portion of the network that transports information from one central location to another central location where it is unloaded onto a local system.

## **Basic Service Set (BSS)**

A coverage area for two or more 802.11-compliant, wireless stations.

## **CSMA/CA**

Carrier Sense Multiple Access with Collision Avoidance.

## **Distributed System (DS)**

Enables mobile device support by providing the logical services necessary to handle address to destination mapping and seamless integration of multiple BSSs.

### **Dynamic Host Configuration Protocol (DHCP)**

Provides a framework for passing configuration information to hosts on a TCP/IP network. DHCP is based on the Bootstrap Protocol (BOOTP), adding the capability of automatic allocation of reusable network addresses and additional configuration options.

### **Extended Service Set (ESS)**

More than one wireless cell can be configured with the same Service Set Identifier to allow mobile users can roam between different cells with the Extended Service Set.

### **Ethernet**

A network communication system developed and standardized by DEC, Intel, and Xerox, using baseband transmission, CSMA/CD access, logical bus topology, and coaxial cable. The successor IEEE 802.3 standard provides for integration into the OSI model and extends the physical layer and media with repeaters and implementations that operate on fiber, thin coax and twisted-pair cable.

### **Fast Ethernet**

A 100 Mbps network communication system based on Ethernet and the CSMA/CD access method.

### **IEEE**

Institute of Electrical and Electronic Engineers.

### **IEEE 802.11a**

A wireless standard that supports high-speed communications in the 5 GHz band using Orthogonal Frequency Division Multiplexing (OFDM). The standard supports data rates of 6, 12, 24, and 54 Mbps.

### **IEEE 802.11b**

A wireless standard that supports wireless communications in the 2.4 GHz band using Direct Sequence Spread Spectrum (DSSS). The standard provides for data rates of 1, 2, 5.5, and 11 Mbps.

### **IEEE 802.11g**

A wireless standard that supports wireless communications in the 2.4 GHz band using supports high-speed communications in the 5 GHz band using Orthogonal Frequency Division Multiplexing (OFDM). The standard provides for data rates of 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps. IEEE 802.11g is also backward compatible with IEEE 802.11b.

### **IEEE 802.1x**

Port Authentication controls access to the switch ports by requiring users to first enter a user ID and password for authentication.

### **IEEE 802.3**

Defines carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.

### **IEEE 802.3u**

Defines CSMA/CD access method and physical layer specifications for 100BASE-TX and 100BASE-FX Fast Ethernet.

### **Infrastructure**

An integrated wireless and wired LAN is called an infrastructure configuration.

**LED**

Light emitting diode used for monitoring a device or network condition.

**Local Area Network (LAN)**

A group of interconnected computer and support devices.

**MAC Address**

The physical layer address used to uniquely identify network nodes.

**Power over Ethernet (PoE)**

A specification for providing both power and data to low-power network devices using a single Category 5 Ethernet cable. PoE provides greater flexibility in the locating of access point's and network devices, and significantly decreased installation costs.

**RADIUS**

A logon authentication protocol that uses software running on a central server to control access to the network.

**RJ-45 Connector**

A connector for twisted-pair wiring.

**Roaming**

A wireless LAN mobile user moves around an ESS and maintains a continuous connection to the infrastructure network.

**Service Set Identifier (SSID)**

An identifier that is attached to packets sent over the wireless LAN and functions as a password for joining a particular radio cell; i.e., Basic Service Set (BSS).

**Simple Network Management Protocol (SNMP)**

The application protocol in the Internet suite of protocols which offers network management services.

**Transmission Control Protocol/Internet Protocol (TCP/IP)**

Protocol suite that includes TCP as the primary transport protocol, and IP as the network layer protocol.

**UTP**

Unshielded twisted-pair cable.

**Virtual LAN (VLAN)**

A Virtual LAN is a collection of network nodes that share the same collision domain regardless of their physical location or connection point in the network. A VLAN serves as a logical workgroup with no physical barriers, and allows users to share information and resources as though located on the same LAN.



## Numerics

100BASE-TX ports 2-3  
10BASE-T ports 2-3

## A

air flow requirements 4-2  
antennas, positioning 4-2, 4-3  
applications 3-1  
    infrastructure 3-2  
    wireless LAN roaming 3-2

## B

Basic Service Set *See BSS*  
bracket, wall mount 4-2  
BSS 3-2

## C

cable  
    crossover B-2  
    specifications B-1  
    straight-through B-2  
channels, maximum C-1  
clients, maximum C-1  
console cable 2-2  
console port 2-2, 2-6  
    pin assignments B-3  
crossover cable B-2  
CSMA/CA 2-2

## D

data rate, options C-1  
desktop mounting 4-2  
distances, maximum C-5

## E

Ethernet connection 5-1

## F

features  
    management 2-7  
    switch 2-7  
front panel of switch 2-1

## I

IEEE 802.11a 2-2  
indicators, LED 2-5  
infrastructure wireless LANs 3-2  
installation  
    connecting devices to the switch 5-2  
    desktop or shelf mounting 4-2  
    port connections 5-1  
    problems A-1  
    site requirements 4-1

## L

LED indicators  
    problems A-1  
location requirements 4-1

## M

management  
    agent 2-2  
    features 2-7  
    out-of-band 2-2  
    SNMP 2-2  
    Web-based 2-2  
maximum distances C-5  
mounting the unit

on a desktop or shelf 4-2

## N

network

connections 5-1

topologies 3-1

network topologies 3-1

infrastructure 3-2

infrastructure for roaming 3-2

null-modem serial cable 2-2

## O

OFDM 2-2

operating frequency C-1

out-of-band management 2-2

## P

password, support 1-2

pin assignments B-1

  100BASE-TX/10BASE-T B-2

  console port B-3

  DB-9 B-3

PoE 2-3

  specifications C-2

ports, connecting to 5-1

Power over Ethernet See PoE

power supply, specifications C-2

power, connecting to 4-7

problems, troubleshooting A-1

## R

rear panel of switch 2-1

reset button 2-6

RJ-45 port connections 5-1

RJ-45 ports 2-3

roaming in wireless LANs 3-2

RS-232 port 2-2

## S

serial cable 2-2

serial port 2-2

site location 4-1

SNMP agent 2-2

status LEDs 2-5

straight-through cable B-2

support, technical 1-1

switching

  introduction to 3-1

## T

technical support 1-1

  e-mail 1-2

telephone 1-2

Web 1-2

troubleshooting

  in-band access A-2

  switch indicators A-1

twisted-pair connections 5-1

## W

wall mounting bracket 4-2

Web-based management 2-2

wireless LANs

  infrastructure 3-2

  roaming 3-2